ZIEGLER (S. L.)

The Treatment of Corneal Ulcer by the General Practitioner.

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THE TREATMENT OF CORNEAL ULCER BY THE GENERAL PRACTITIONER.*

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Corneal ulcer, although not necessarily dangerous to the integrity of the eyeball, is nevertheless, even in its simpler forms, fraught with most serious consequences as regards the preservation of good visual acuity. This is especially true where the ulcer happens to be centrally located, as the slightest nebulous opacity formed in the process of healing will seriously affect the power of vision. Unfortunately, the great majority of these cases occur among young children, and if the treatment is not properly applied in the beginning of the attack there will result a limitation of vision that may influence the whole after life of the individual. In many cases the services of a specialist are not available, because the sudden onset of the attack, or its occurrence in a locality remote from our medical centers, will not permit of any delay in securing relief; and hence, as the general practitioner is, perforce, first called upon to treat these cases, I think a brief *résumé* of

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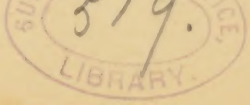

the ætiology and proper methods of treatment may prove to be of some interest on this occasion.

For our present purposes we may simply divide all corneal ulceration into two classes: (1) simple ulcer and (2) sloughing ulcer. The latter variety this paper does not propose to discuss. The former may manifest itself under somewhat protean types, but originating in the same underlying cause. We may have the most superficial, grayish ulceration; we may have an indolent, necrotic ulcer that pursues a sluggish course and shows but little inflammatory reaction; we may have a transparent or faceted ulcer; we may have single or multiple erosion ulcers, where there is friction of the lids and perverted ocular secretions; and lastly, we may have the condition known as phlyctenular keratitis. So long as these conditions manifest themselves under the simpler forms, just so long is the general practitioner competent to care for and treat them; but whenever any of these apparently harmless conditions pass into the more dangerous form of sloughing ulcer, or threaten to perforate and injure the integrity of the eyeball, then the care of a specialist is undoubtedly demanded.

Aside from these local conditions, the general symptoms will present so characteristic a clinical picture that the diagnosis can not be mistaken. The child will have an intense fear of light, hiding its head in a pillow or in the folds of its mother's dress. There is excessive lacrymation and often some muco-purulent discharge. The nostrils are filled with viscid secretions that may even hang down on the lip. The excoriations at the outer angle of the eye and around the nostril show how acrid and irritating these secretions are. There may be an acneous eruption of the face. The surface of the whole body appears relaxed, the skin is bathed in perspiration, and the hair on the head is frequently matted with moisture.

Those who have carefully followed the ophthalmic literature of the past few years have possibly noticed the growing tendency to ascribe the origin of corneal lesions to associated disturbances in the lacrymo-nasal apparatus. I think we may safely say that fully ninety per cent. of corneal lesions take their origin directly from pre-existent pathological processes affecting the intranasal tissues and secretions. Careful inspection will almost invariably reveal associated lesions of the eye and nostril of the same side, which is most markedly shown where the disturbance is confined to a single eye and the corresponding nostril.

Constitutional dyscrasiæ do not count for as much in the pathogenesis as they were once thought to do. A strumous diathesis, of course, lowers the tone of the system, and thereby exposes the eye to these microbic attacks. Unhygienic surroundings and the poor dietetic regimen that usually accompanies such conditions will undoubtedly add a genetic factor to the predisposing cause. While we are convinced that the immediate cause is purely local (lacrymo-nasal), we must not overlook the importance of the more remote cause, which we consider to be a perversion of the gastro intestinal functions. Chronic constipation, errors in diet, the excessive use of coffee or tea, and over-indulgence in sweets and pastry are the most potent factors. In children, especially, these indulgences sooner or later sap the vitality and create a peculiar irritability of the whole gastro-intestinal tract. By reflex action the nasal condition sympathizes with the disturbance in the stomach, and thus indirectly the train of symptoms may be traced back from the stomach to the eye itself. Accompanying the gastric disturbance is a peripheral vaso motor relaxation which allows the surface of the body to be constantly bathed in perspiration. This is probably explained by the well-known interrelation of gastro-duodenal lesions to those of the

skin; as, for example, duodenal ulcer complicating burn of the skin, or *vice versa*, urticaria from duodenal acidity, and the erythematous manifestations caused by eating strawberries or shellfish.

To return to the local conditions: The ocular disturbance may be purely reflex from the nose; it may result from decomposition of the confined tears from simple obstruction of the duct; or it may originate from the regurgitation of septic secretions which carry the microbes up through the contracted lumen of the lacrymal duct, but do not allow the tears to travel downward, because of the accumulation of viscid secretions in a previously obstructed passage. Granting now the presence of this septic material in the ocular *cul-de-sac*, there is required only a lesion in the superficial corneal epithelium—whether from friction of the lids, from maceration, or from traumatism—in order to have infection occur and the ulcerative process immediately inaugurated.

Even in the exanthemata or other fevers, where the cornea is liable to a *direct* attack from the disease itself, there is a still greater danger from this possible infection by perverted secretions, since every febrile disturbance perverts the normality of the nasal secretions, and septic contamination of the eye may easily follow.

As previously pointed out, the great danger to vision is due to the central location of the ulcer, and unfortunately a large percentage of corneal ulcers are central. If the cause of these central ulcers should be carefully inquired into, there would doubtless be no question as to their lacrymo-nasal origin. The central location of the ulcer may be accounted for by the fact that in the act of winking the eyelids come together over the cornea and carry ahead of them any pathological *débris* which is present, and as they recede leave behind them a *drift* of this septic mate-

rial lying in the exact center of the cornea. Here it sooner or later causes the corneal tissue to break down into an ulcer. This occurs most frequently in cases where there are mild atrophic lesions of the nose, which are usually accompanied by a peculiar, musty odor of the nasal secretions.

Treatment.—Having thus clearly stated our dictum as to the nasal origin of this affection, the treatment resolves itself into the simple matter of treating the nose, together with the application of a mild, soothing lotion to the eye itself. While making no pretensions to being a specialist in the treatment of diseases of the nose, I am nevertheless constrained to act on this conviction as to the nasal origin of corneal ulcerations and to apply the remedy accordingly.

As to the treatment of the nose, I have found it very necessary to use an alkaline and antiseptic solution to cleanse the nasal chambers. Dobell's solution is valuable for this purpose, but the best form is that known as Dr. Goodman's compound tablet of sodium silicofluoride,* which can be dissolved in water as needed. This solution may be used two or three times a day in a constant spray atomizer. A syringe or bulb nasal douche will be preferable for use in the case of very small children.

The most important therapeutic measure, however, is the local application of compound tincture of benzoin (long known as Turlington's balsam) to the hypertrophied nasal mucous membrane, daily at first, and then on alternate days. My attention was first called to the advantages of this drug by Dr. S. MacCuen Smith some five years ago, and since that time it has proved itself to be, *par excellence*, the one therapeutic agent that will most promptly reduce the turgescent and hypertrophied turbinals, and restore the per-

* These tablets are best prepared by Llewellyn, 1410 Chestnut Street, or Marshall, Sixteenth and Race Streets, both of whom also manufacture a very excellent form of atomizer.

verted secretions to their normal condition. It is at once antiseptic, astringent, depleting, and stimulating.

This application is best made with absorbent cotton wrapped on the end of a wire applicator,* dipped into the solution, and inserted far back into the nostril, until the lower portion of the mucous lining is well coated. It is then swept under the lower turbinated as it is withdrawn, in order to help reduce any swelling around the nasal orifice of the lacrymal duct and its terminal fold, known as the valve of Hasner. If the patient is a child, it should be laid upon its back on the mother's lap, with its head between the knees of the physician, when the application can be quickly made. If the pharynx seems much congested, a similar application of the benzoin will facilitate recovery. Of course, if the disturbance arises from any more serious naso-pharyngeal lesion, as polypus, septal spurs, enlarged tonsils, or adenoid vegetations, the patient should be promptly referred to the laryngologist for relief.

There may be some little smarting following the benzoin application and a copious flow of secretion, but this will only last for a few minutes. If, however, you desire to be somewhat milder and more elaborate in your treatment, you may apply a series of four solutions:

1. Cocaine, gr. xxx in aq. dest. f ℥ j, to relieve pain and constringe the relaxed mucous membrane and blood-vessels.

2. Antipyrine, gr. xxx in aq. dest. f ℥ j, to hold the tissues down for several hours, and thus maintain the comfort of physiological breathing.

3. Tinct. benzoin comp. as the important corrective and remedial agent.

4. Camphor and menthol, āā gr. xxx in fluid albolene f ℥ j, to pleasantly stimulate and leave behind a cool, soothing sensation.

* Made by Gemrig, 109 South Eighth Street, Philadelphia.

After this treatment has been used for some time the cocaine and antipyrine may be stopped, and the benzoin (or benzoin and camphor menthol) continued as long as it seems to accomplish its purpose. A persistence in the use of the treatment after the subsidence of the ocular symptoms may prevent a future recurrence of the ulcer, the liability to which remains so long as the nasal lesion persists. The treatment outlined above is equally efficient for the relief of nasal disturbances when associated with ocular lesions other than those of the cornea. It is also useful for the relief of an attack of acute rhinitis, particularly when associated with acute catarrhal conjunctivitis in the relation of a causal factor.

For the local treatment of the eye an antiseptic and soothing lotion should be employed, consisting of:

℞ Sodii biborat..... gr. v;
Ac. boric..... gr. x;
Aq. rosæ (or aq. camph.), } āā ..... f ℥ j.
Aq. destillat., }

M. et sig.: Drop in the eye freely four times a day.

The eye should be carefully examined by separating the lids, and atropine instilled at the first visit. The atropine need not be continued if the pupil dilates freely. If there is marked blinking and fear of light, cocaine, gr. ij, and eserine salicylate, gr. $\frac{1}{8}$ to f ℥ j, may be added to the lotion or used in a separate solution. Hot stupes are often highly beneficial; they may be applied to the eye for fifteen minutes three or four times a day. Calomel or iodoform may be dusted on the ulcer. Fresh cod-liver oil is often useful as a local application. A pressure bandage will sometimes give relief.

The diet should be carefully regulated. My invariable formula for children is, "*No tea, no coffee, no cakes, and no candy.*" Of these, *coffee* is by far the most harmful. It ex-

hausts the vitality of the patient and irritates the whole alimentary canal more than any other article of diet. If the bowels are constipated a few doses of calomel and soda will usually regulate them. The phosphate of sodium, as recommended by Dr. H. C. Wood, is an excellent corrective, saline aperient, and cholagogue of great efficiency. The granular form of this salt is probably the most soluble.

An excellent tonic for these cases is that known in the traditions of Wills Hospital as "Dr. Goodman's mixture":

℞ Hydrarg. bichlor..... gr. j;
Liq. pot. ars..... f ʒ ij;
Tinct. ferri chlor..... f ʒ iv;
Acid. phosph. dil..... f ℥ j;
Syr. limonis.....q. s. f ℥ iv.

M. et sig.: Take a quarter to a teaspoonful in water after each meal (the dose to be regulated according to age and circumstances).

The relaxed condition of the skin is best relieved by daily baths in salt water, accompanied by friction of the skin or massage, and followed by an alcohol sponging or a rubbing down in sweet oil or sweet-almond oil. Improved hygiene and a nutritious diet are necessary prerequisites to a permanent recovery. Proper exercise is often of the highest remedial value. We may gain a point by combining exercise with play, as in the dancing class or in rambles through the country, both of which are especially attractive to children.

If this peculiar ocular irritability should persist in spite of the treatment instituted, or if corneal perforation is threatened, or if there is an excessive tendency toward sloughing keratitis, the case should be promptly referred to the specialist for cauterization of the ulcer, canthoplasty, or rapid dilatation of the lacrymal duct, one or all, as his best judgment may dictate.

This plan of treatment as above outlined has been thoroughly tested for several years in Dr. Goodman's clinic at the Wills Hospital, with which I have the honor to be associated, and also in our clinic at St. Joseph's Hospital, and, I may add, the uniform success of this method of treatment has insured its permanency.

To briefly summarize:

Simple corneal ulcer is a purely local inflammatory process, arising *chiefly* from infection by septic secretions and originating in lacrymo-nasal lesions.

To epitomize the treatment:

1. Treat the nose locally with tinct. benzoin comp. and the use of a cleansing spray.

2. Use a mild antiseptic eye wash to the eye locally, a mydriatic if necessary, and hot applications when indicated.

3. Regulate the diet, give salt-water baths, and improve the hygiene generally.

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